TOXIC ANTERIOR SEGMENT SYNDROME

Protocol of essay

Submitted for partial fulfillment of M.Sc degree

In ophthalmology

By

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Cairo 2008

INTRODUCTION

The Toxic Anterior Segment Syndrome (TASS) is a sterile post-operative inflammatory reaction caused by a non - infectious substance that enters the anterior segment resulting in a toxic damage to the intra-ocular tissues. The process typically starts in the first 12 to 48 hours after cataract/anterior segment surgery, is limited to the anterior segment of the eye, is always Gram stain and culture negative, and usually improves with the steroid treatment.[1-3]

The primary differential diagnosis is the post-operative endophthalmitis which is defined as severe inflammation involving both the anterior and posterior segments of the eye following intra-ocular surgery.[4]

TASS has numerous causes attributed to:

1. The Contaminants on surgical instruments.[5]

2. The Products introduced into the eye during surgery including intraocular solutions with inappropriate chemical composition, concentration, pH, or osmolarity; denatured ophthalmic viscosurgical devices; enzymatic detergents ;

bacterial endotoxins; oxidized metal deposits and residues; and factors related to intraocular lenses such as residues from polishing or sterilizing compounds.[6,7]

3. Other substances that enter the eye during or after surgery as the topical ointments and, or the talc powder from surgical gloves.[8]

An outbreak of TASS is an environmental and toxic control issue that requires complete analysis of all medications and fluids used during surgery, as well as complete review of operating room and sterilization protocols.[9]

Suboptimal reprocessing of cataract surgical equipment may evolve over time in busy, multidisciplinary surgical centers. Clinically significant contamination of surgical equipment may result from inappropriate maintenance of steam sterilization systems.[9]

Standardization of protocols for reprocessing of cataract surgical equipment may prevent outbreaks of TASS and may be of assistance during outbreaks investigations.[9]

Aim of the work

The aim of this work is to study the etiology, pathology and management of Toxic Anterior Segment Syndrome (TASS) for early detection, even prevention of the toxicity in anterior segment surgery, and to differentiate TASS from the infectious endophthalmitis.

Toxic Anterior Segment Syndrome (TASS) is a serious complication but likely predictable, preventable as well as easily treatable.

The other aim is to know the importance of the standardization of protocols for reprocessing of cataract surgical equipment.

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Acknowledgement

Thanks are given to **ALLAH** the source of all knowledge, by whose abundant aid this work has come to fruition.

It has been a great honor to work under the supervision of **Professor/ Magda Mohamed Mahmoud** Samy, Professor of ophthalmology, Faculty of Medicine, Ain Shams University. I am greatly indebted to her for suggesting, planning the subject and supervising the whole work. I will never forget her unlimited help, continuous support, kind encouragement and wise guidance. To her, words of praise are not sufficient and i am really greatly indebted to her.

I would like also to express my sincere gratitude and appreciation to **Lecturer / Sameh Abd-El Rahman**, Lecturer of ophthalmology , Faculty of Medicine, Ain Shams University, for his helpful guidance, valuable advice and generous help in this work. To him i shall be forever grateful.

Contents

List of abbreviations

AMO Advanced Medical Optics

BA Benzyl alcohol

BAC Benzalkonium chloride

BCEC Bovine corneal endothelial cells

BSS Balanced salt solutions

CC Cubic Centimeter

CEC Corneal endothelial cells

CPS Centipoises

DLEK Deep lamellar endothelial keratoplasty

DLK Deep lamellar keratitis

EMEM Eagle modified minimum essential medium

ET Endotoxin

EVS Endophtalmitis Vitrectomy Study

GC-MS Gas chromatography –mass spectrometry

GSH Glutathione

I/A Irrigation/aspiration

IOL Intraocular lens

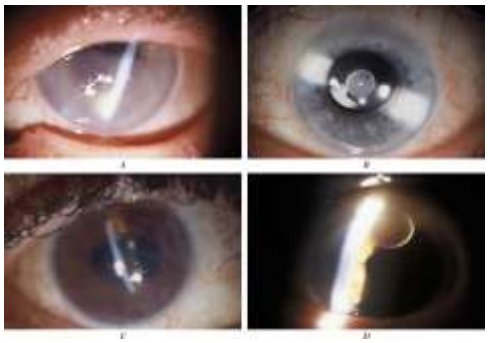
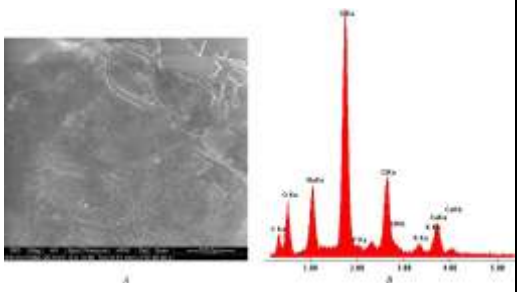
IOP Intraocular pressure

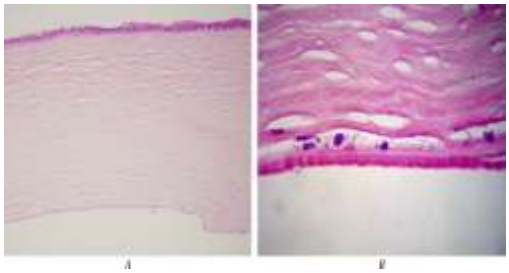
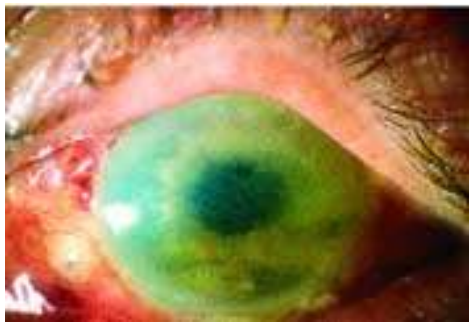
LPS Lipopolysaccharide

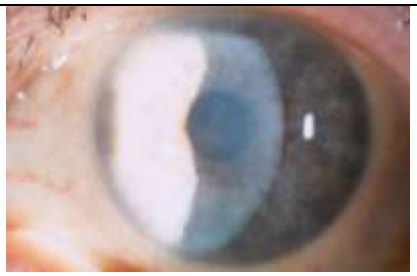
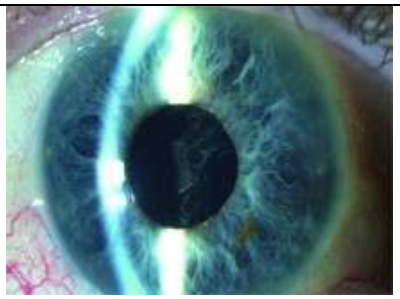
OVD Ophthalmic visco-surgical devices

NSAIDs	Non-steroidal anti-inflammatory drugs
mm	milli-meter
PBS	Phosphate-buffered saline
PI	Povidone iodine
PKP	Penetrating keratoplasty
PMMA	Polymethylmeta-acrylate
PVP	Polyvinylpyrrolidine-iodine
SEM	Scanning electron microscopy
TA	Triamcinolone acetonide
TASS	Toxic anterior segment syndrome
TECDS	Toxic endothelial cell destruction syndrome
TEM	Transmission electron microscopy
um	micro-meter
VO	Zero-shear viscosity
vTA	Vehicle-removed Triamcinolone acetonide

List of figures

No	Preview	Description
1		Slit lamp clinical photographs from 4 of the 8 cases taken during the first postoperative week. Corneal edema can be seen in A and C, where the oily material was found to be coating the corneal endothelium. In B and D, the material can be seen as a large bubble floating into the anterior chamber. J Cat Refract surg 2006:32:227-235
2		A: Scanning electron photomicrograph of the explanted lens in case 1, showing an area with a layer of the coating material. Some cracks formed within this layer in the dry state. B: Energy dispersive x-ray spectrum obtained at the level of the material coating the lens surface, showing the presence of carbon , oxygen , and silicon as well as peaks of sodium , chloride , potassium , phosphate and calcium . J Cat Refract surg 2006:32:227-235

3		Light photomicrographs of histological sections obtained from the corneal button in case number 1 (hematoxylin and eosin stain). A: Photomicrograph showing variable areas of epithelium thinning, as well as thickening of the stroma, with condensation of posterior lamellae. B: Photomicrograph showing the intact Descemet's membrane, with complete absence of the corneal endothelium. J Cat Refract surg 2006:32:227-235
4		Diffuse limbus-to-limbus corneal edema. J Cat Refract surg 2006:32:227-235

5		Diffuse Limbus-to-limbus corneal edema and hypopyon. Ahmed Al-Ghoul**.** TASS, Feb 14 2008 http://emedicine.medscape.com/article/1190343
6		Diffuse Limbus-to-limbus corneal edema . Ahmed Al-Ghoul**.** TASS, Feb 14 2008 http://emedicine.medscape.com/article/1190343
7		Fibrin in the AC in a case of TASS www.emedicine.lt/site/news/1717/tass
8		Hypopyon in case of TASS. J Cat Refract surg 2006:32:227-235